

CLAIMS

What is claimed is:

1. A mapping apparatus, comprising:
a cassette having a plurality of slots into which planar objects are inserted, and at least one reflector which reflects light beams irradiated into the plurality of slots; and
a sensor unit having a light emitting unit and a light receiving unit, the sensor unit determining whether the planar objects have been inserted into the respective slots by determining whether a light beam, irradiated from the light emitting unit, is reflected from the reflector and then received by the light receiving unit.
2. The mapping apparatus according to claim 1, wherein the reflector and the light receiving unit are provided so that an angle of the reflector and/or a position of the light receiving unit allow the light beam irradiated from the light emitting unit to be reflected from the reflector and received by the light receiving unit.
3. The mapping apparatus according to claim 1, wherein the sensor unit is provided so that a light beam irradiation angle of the light emitting unit and/or a position of the light receiving unit prevent a reflected light beam from being received by the light receiving unit when the light beam irradiated from the light emitting unit is reflected from a corresponding planar object inserted into the cassette.
4. The mapping apparatus according to claim 1, wherein:
the plurality of slots are provided in parallel to the allow planar objects to be inserted therein; and
the at least one reflector is provided at at least one lateral end of the plurality of slots.
5. The mapping apparatus according to claim 1, wherein:
the plurality of slots have inlets formed therein so as to allow circular planar objects to be inserted therein; and
the at least one reflector is provided at positions opposite to the inlets of the slots to be offset from a center position of the slots.

6. The mapping apparatus according to claim 1, wherein the at least one reflector is provided to form an acute angle with a side surface of the cassette.

7. The mapping apparatus according to claim 4, further comprising a back reflector provided on a back inner surface of the slots.

8. The mapping apparatus according to claim 7, wherein an irradiation position of the sensor unit is offset from a center position of the slots.

9. A mapping apparatus, comprising:

a cassette having a plurality of slots, each with a predetermined thickness and width, provided in parallel to allow planar objects to be inserted therein, and at least one reflector to reflect a light beam irradiated into the plurality of slots; and

a sensor unit having a light emitting unit to irradiate the light beam and a light receiving unit to receive the light beam when reflected from the reflector, the sensor unit determining whether the planar objects have been inserted into the respective slots by irradiating the light beam while moving along a thickness direction of the slots, and determining whether the irradiated light beam is reflected from the reflector and then received by the light receiving unit.

10. The mapping apparatus according to claim 9, wherein the reflector and the light receiving unit are provided so that an angle of the reflector and/or a position of the light receiving unit allow the light beam irradiated from the light emitting unit to be reflected from the reflector and received by the light receiving unit.

11. The mapping apparatus according to claim 9, wherein the sensor unit is provided so that a light beam irradiation angle of the light emitting unit and/or a position of the light receiving unit prevent a reflected light beam from being received by the light receiving unit when the light beam irradiated from the light emitting unit is reflected from a corresponding planar object inserted into the cassette.

12. The mapping apparatus according to claim 9, wherein the at least one reflector is provided at at least one lateral end of the plurality of slots.

13. The mapping apparatus according to claim 9, wherein:
the plurality of slots have inlets formed therein so as to allow the planar objects to be inserted therein; and
the at least one reflector is provided at positions opposite to the inlets of the slots to be offset from a center position of the slots.

14. A flat panel display mapping apparatus, comprising:
a cassette having a plurality of slots, each with a predetermined thickness and width, provided in parallel to allow flat panel displays to be inserted therein, and at least one reflector to reflect a light beam irradiated into the plurality of slots; and
a sensor unit having a laser generating unit to irradiate a laser beam and a light receiving unit to receive the laser beam when reflected from the reflector, the sensor unit determining whether the flat panel displays have been inserted into the respective slots by irradiating the laser beam while moving along a thickness direction of the slots, and determining whether the irradiated laser beam is reflected from the reflector and then received by the light receiving unit.

15. The flat panel display mapping apparatus according to claim 14, wherein the flat panel displays comprise liquid crystal display glasses.

16. The flat panel display mapping apparatus according to claim 14, wherein the reflector and the light receiving unit are provided so that an angle of the reflector and/or a position of the light receiving unit allow the laser beam irradiated from the laser generating unit to be reflected from the reflector and received by the light receiving unit.

17. The flat panel display mapping apparatus according to claim 14, wherein the sensor unit is provided so that a laser beam irradiation angle of the laser generating unit and/or a position of the light receiving unit prevent a reflected laser beam from being received by the light receiving unit when the laser beam irradiated from the laser generating unit is reflected from a corresponding one of the flat panel displays inserted into the cassette.

18. The flat panel display mapping apparatus according to claim 14, wherein at least one reflector is provided at at least one lateral end of the plurality of slots.

19. The flat panel display mapping apparatus according to claim 14, wherein:
the plurality of slots have inlets formed therein so as to allow the flat panel displays to be inserted therein; and
the at least one reflector is provided at positions opposite to the inlets of the slots to be offset from a center position of the slots.

20. A mapping apparatus, comprising:
a cassette having a plurality of slots, each with a predetermined thickness and width, provided in parallel to allow planar objects to be inserted therein, and at least one reflector provided lengthwise along the plurality of slots to reflect a light beam irradiated into the slots;
a sensor having a light emitting unit to irradiate the light beam;
a light receiving unit to receive the light beam when reflected from the reflector; and
a control unit to irradiate the light beam while moving the sensor along a longitudinal direction of the at least one reflector, detect electrical characteristic variations generated in response to the irradiated light beam being reflected from the at least one reflector and then received by the light receiving unit, and obtain position information of the slots with planar objects inserted therein through a position of the sensor at a time the electrical characteristic variations are detected.

21. The mapping apparatus according to claim 20, wherein a start position of the slots and a pitch between the slots are considered in obtaining the position information of the slots.

22. A method of controlling a mapping apparatus, the mapping apparatus including a cassette having a plurality of slots, each with a certain thickness and width, provided in parallel to allow planar objects to be inserted therein, and at least one reflector provided lengthwise along the slots to reflect light beams irradiated into the slots, and a sensor having a light emitting unit to irradiate a light beam and a light receiving unit to receive the light beam when reflected from the at least one reflector, the method comprising:

irradiating the light beam while moving the sensor along a longitudinal direction of the at least one reflector;

detecting electrical characteristic variations generated by the sensor in response to the irradiated light beam being reflected from the at least one reflector and then received by the light receiving unit; and

obtaining position information of slots with planar objects inserted therein through a position of the sensor at a time the electrical characteristic variations are detected.

23. The control method according to claim 22, further comprising considering a start position of the slots and a pitch between the slots when obtaining the position information of the slots.

24. A mapping apparatus, comprising:

a receiving unit comprising:

a plurality of slots into which objects are inserted, and

at least one reflector provided at a lateral side of the plurality of slots to reflect a light beam sent through the slots; and

a sensor unit comprising:

a light emitting unit sending the light beam into the slots, and

a light receiving unit receiving the light beam reflected from the at least one reflector in response to the respective slots being empty.

25. The mapping apparatus of claim 24, wherein the at least one reflector comprises a plurality of reflectors, and a single one of the plurality of reflectors is correspondingly provided at a lateral side of each of the slots.

26. A mapping apparatus, comprising:

a receiving unit comprising:

a plurality of slots into which objects are inserted, and

at least one reflector provided at a back inner surface of the slots to be offset from a center position of the slots; and

a sensor unit sending light into the slots and receiving the light reflected from the at least one reflector in response to the respective slots being empty.

27. The mapping apparatus of claim 26, wherein the at least one reflector comprises a plurality of reflectors, and a single one of the plurality of reflectors is correspondingly provided at a back inner surface of each of the slots.